

Serial No.: 09/755,282
Response after Notice of Appeal

Patent / Docket No. 1999-0149/24061.302
Customer No.: 42717

A Listing of the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-33. (Cancelled)

34. (Currently amended) A bond pad structure, comprising:

a semiconductor substrate;

a passivating layer forming multiple free-standing vertical islands to provide interlocking grid structures over said semiconductor substrate, wherein the vertical islands are separated by openings in said passivating layer;

a contiguous barrier layer formed of tantalum nitride over said vertical islands of said passivating layer and in said openings; and

a conducting pad formed within said openings and over said interlocking grid structures and over said barrier layer, whereby an upper surface of said conductive pad provides improved adhesion for subsequently formed bonds.

35. (Previously presented) The bond pad structure of Claim 34, wherein said conductive pad is formed of copper.

36. (Original) The bond pad structure of claim 34, wherein said passivating layer is selected from the group consisting of silicon oxide, silicon nitride and polyimide.

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37. (Currently amended) A bond pad structure, comprising:
a semiconductor substrate;
comprising interlocking grid structures, formed over said semiconductor substrate;
a passivating layer ~~forms said~~; forming interlocking grid structures, said passivating layer
having multiple openings to said interlocking grid structures to form multiple free-standing vertical
islands;

a barrier layer formed of tantalum nitride over said passivating layer and in said openings,
wherein said barrier layer is contiguous over said vertical islands;

a conducting pad formed over said interlocking grid structures and over said barrier layer,
whereby an upper surface of said conductive pad provides improved adhesion for subsequently
formed bonds,

wherein said bond pad forms an interlocking grid array in the bond pad via contact region,
which is approximately 100 by 100 microns square and the size of the island structures are from
about 10 to 25 microns in width, approximately 4 microns in height, and from about 4 to 10 in
number, of interlocking grid structures, increasing surface area for improved adhesion.

38. (Previously presented) The bond pad structure of Claim 34, wherein said conductive
bond pad is formed of aluminum.

39. (Cancelled)

40. (Currently amended) A bond pad structure for a semiconductor device, the structure
comprising:

an insulator layer adjacent to a semiconductor substrate;

a metal wiring layer adjacent to the insulator layer;

a passivation layer adjacent to the metal wiring layer, wherein at least a portion of the
passivation layer is configured to provide a plurality of island structures separated by spaces that
expose a portion of the underlying metal wiring layer;

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a contiguous metal barrier layer formed of tantalum nitride covering the passivation layer and the exposed portions of the metal wiring layer, wherein the metal barrier layer conforms to a shape provided by the island structures and does not completely fill the spaces between the island structures; and

a metal pad layer covering the metal barrier layer, wherein the metal pad layer fills the spaces between the island structures not filled by the metal barrier layer and rises above the island structures.

41. (Previously presented) The bond pad structure of claim 40 wherein the metal barrier layer is substantially the same thickness throughout the bond pad structure.

42. (Cancelled)

43. (Previously presented) The bond pad structure of claim 40 wherein the passivation layer is selected from the group consisting of silicon oxide, silicon nitride and polyimide.

44. (Previously presented) The bond pad structure of claim 40 wherein the metal pad layer is formed of aluminum.

45-49 (Cancelled)